Name of Lesson/Topic of Study **The Energy of It All** Grade Level(s) **6** Duration of Lesson/Unit **2 Days** Date **06/23/2011**

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| NEXT GENERATION SUNSHINE STATE STANDARDS: | |
| **SC.6.P.11.1** Explore the Law of Conservation of Energy by differentiating between potential and kinetic energy. Identify situations where potential energy is transformed into kinetic energy and vice versa.  **SC. 6. N.1.1** Define a problem from the sixth grade curriculum, use appropriate reference materials to support scientific understanding, plan and carry out scientific investigation of various types, such as systematic observations or experiments, identify variables, collect and organize data, interpret data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions | |
| LEARNING GOALS: What will your students will be able to do by the end of class? | |
| The students will be able to provide an example, identify, and explain the various forms of energy. | |
| KEY VOCABULARY | KEY POINTS. What three to five main ideas or steps will you emphasize in your lesson? |
| Energy, Kinetic, Potential, Joule, Mass, Velocity, Temperature, Friction, energy transfer, Radiometer, Climate, Magnetic | Energy could take different forms  Energy is conserved  Energy could be transformed from one form to another. |
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|  | Details of activity (include teacher and student notes) | Essential Questions  (Probes/Questions to ask students at every phase in the lesson) | MATERIALS | EVALUATE  Performances at every phase of the lesson. |
| ENGAGEMENT: Object, event or question used to engage students. Connections facilitated between what students know and can do. How will you focus, prepare and engage students for the lesson’s objective? | The students will be separated into two groups. The groups will rotate after lunch:  Group A-Plasma Ball  Group B-Magic Planet | Group A:  What do you see happening?  Is there a difference in the light when you use your hand in various ways?  Group B:  What do you see happening?  How does human activity affect the global climate? | N/A | Group A: Students will draw what they see happening at the plasma sphere in the diagram provided.  Group B: Student responses to probing questions. |
| EXPLORATION: Objects and phenomena are explored. Hands-on activities, with guidance. How will students engage in open-ended exploration of real phenomena, discussion about their discoveries, ideas, and questions that arise? | Group A: Energy Dance Floor and How Hot Are You.  Group B: Radiometer | Group A: What form of energy is a result of the action displayed?  Group B: What happens to the speed of the blades as you put clouds between the light gun and the radiometer? | Cloud Transparencies | Group A and B: Responses to worksheet. |
| EXPLANATION: Provide scientific explanation. How will you convey the knowledge and/or skills of the lesson? What will your students do to process this information? | The Continuum | The teachers will provide students with summarizing points relating to forms of energy. | N/A | Responses to statement provided by teacher and students. |
| ELABORATION: Activities allow students to apply concepts in contexts, and build on or extend understanding and skill. In what ways will your different learners attempt the objective on their own? How will students apply the new knowledge and skills to solving a problem or meeting a challenge? | Circuit Lab/Build Your Own Radiometer | How does what you learned at the Science Museum apply to the current lab. | Light Bulbs, Lights, Batteries, Photocells, Wires, Resistors, Circuit Boards, and Volt Meters. | Responses to lab worksheet. |

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| EXTENSION: How will you incorporate ideas for further exploration? |
| Homeostasis Lab (Human Growth and Development) and the Discussion of Global Warming |

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| DIFFERENTIATION: How will you differentiate your instruction to reach the diversity of learners in your classroom (ELL STRATEGIES/IEP IMPLEMENTATION)? |
| The students will be given additional time to complete required activities. |

**A. Engagement:**  
Engagement is a time when the teacher is on center stage. The teacher poses the problem, pre-assesses the students, helps students make connections, and informs students about where they are heading.

The purpose of engagement is to:

* Focus students' attention on the topic.
* Pre-assess what students' prior knowledge.
* Inform the students about the lesson's objective(s).
* Remind students of what they already know that they will need to apply to learning the topic at hand.
* Pose a problem for the students to explore in the next phase of the learning cycle.

Evaluation of Engagement: Evaluation's role in engagement revolves around the pre-assessment. Find out what the students already know about the topic at hand. The teacher could ask questions and have the students respond orally and/or in writing.

**B. Exploration:**   
Now the students are at the center of the action as they collect data to solve the problem. The teacher makes sure the students collect and organize their data in order to solve the problem. The students need to be active. The purpose of exploration is to have students collect data that they can use to solve the problem that was posed.

Evaluation of Exploration: In this portion of the learning cycle the evaluation should primarily focus on process, i.e., on the students' data collection, rather than the product of the students' data collection. Teachers ask themselves questions such as the following:

* How well are the students collecting data?
* Are they carrying out the procedures correctly?
* How do they record the data?
* Is it in a logical form or is it haphazard?

**C. Explanation:**  
In this phase of the process, students use the data they have collected to solve the problem and report what they did and try to figure out the answer to the problem that was presented. The teacher also introduces new vocabulary, phrases or sentences to label what the students have already figured out.

Evaluation of Explanation: Evaluation here focuses on the process the students are using -- how well can students use the information they've collected, plus what they already knew to come up with new ideas? Using questions, the teacher can assess the students' comprehension of the new vocabulary and new concepts.

**D. Elaboration:**   
The teacher gives students new information that extends what they have been learning in the earlier parts of the learning cycle. At this stage the teacher also poses problems that students solve by applying what they have learned. The problems include both examples and non-examples.

Evaluation of Elaboration: The evaluation that occurs during elaboration is what teachers usually think of as evaluation. Sometimes teachers equate evaluation with "the test at the end of the chapter." When teachers have the students do the application problems as part of elaboration, these application problems are "the test."

<http://www.agpa.uakron.edu/p16/btp.php?id=learning-cycle>